



## EPA Region 7 TMDL Review

**TMDL ID:** KS-KLR-LM021001;  
KS-KLR-05-233-17,18,20&21;  
KS-KLR-233-21;  
KS-KLR-05-505-8,10,11,13&14;  
KS-KLR-05-741-1,2,3&4;  
KS-KLR-05-232-4  
KS-KLR-07-507-14,16,18,20,22&31;  
KS-KLR-07-712-12

**Waterbody ID(s):** KS-KLR-LM021001;  
KS-KLR-05-233-17,18,20&21;  
KS-KLR-233-21;  
KS-KLR-05-505-8,10,11,13&14;  
KS-KLR-05-741-1,2,3&4;  
KS-KLR-05-232-4  
KS-KLR-07-507-14,16,18,20,22&31;  
KS-KLR-07-712-12

**Waterbody Name(s):** Tuttle Creek Lake; Big Blue River, lower; Big Blue River, upper; Black Vermillion River; Little Blue River, lower; Little Blue River; Mill Creek; Rose Creek

**Tributary(ies):** Horseshoe Creek; Fancy Creek; Coon Creek; Roubidoux Creek; North Fork; Black Vermillion River

**Pollutant(s):** Atrazine  
**State:** KS

**HUC(s):** 10270205  
10270207

**Basin:** Kansas-Lower Republican

**Submittal Date:** 01/09/2007

**Approved:** Yes

### Submittal Letter

*State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.*

This TMDL was officially submitted on January 9, 2007 to the EPA. Additional information in the form of a revised TMDL was received by e-mail attachment February 26, 2007 and more information related to the submittal was received May 17, 2007.

This TMDL includes a phase II TMDL for Tuttle Creek Lake, the phase I TMDL was approved January 18, 2000.

### Water Quality Standards Attainment

*The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.*

The LCs are expressed as load duration curves which account for seasonal variation in flow for each impaired segment. The relationship between the targeted pollutant and the pollutant causing the impairment is direct.

The endpoints are set such that an average monthly atrazine exceedance over 3 ug/L will occur no more frequently than once every three years in the lake or its watershed, annual average atrazine concentration will be below 3 ug/L in Tuttle Creek Lake, its outfall and the streams comprising its watershed, and no individual sample will exceed the acute criterion of 170 ug/L.

Meeting the allocations set forth in the TMDL will result in the attainment of WQS.

#### **Numeric Target(s)**

*Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.*

The applicable WQS given are domestic water supply (3 ug/L), aquatic life support-chronic (3 ug/L), and aquatic life support-acute (170 ug/L).

Designated beneficial uses of the impaired streams are general purpose with expected aquatic life support. Additionally, Tuttle Creek Lake, Big Blue River, Little Blue River, and Black Vermillion River are designated for domestic water supply.

This TMDL addresses the impairments to chronic aquatic life support and domestic water supply and will be protective of the acute aquatic life criteria.

#### **Pollutant(s) of concern**

*An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.*

The link between the numeric targets and pollutant of concern is direct. LCs are expressed through the use of load duration curves at multiple points in the affected drainage area.

#### **Source Analysis**

*Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.*

The primary source is identified as spring (May and June) runoff from cropland in the Big Blue, Little Blue, and Black Vermillion rivers' watersheds. Tuttle Creek Lake is primarily affected by atrazine transported in the Big Blue River. Sources of this runoff are located in Kansas and Nebraska. Each state's load by watershed is estimated from stream concentrations and river discharge. Possible exceedances of the acute criterion are hypothesized in the Big Blue River to account for differences in atrazine concentrations between Barneston, NE and Marysville, KS. A finer degree of resolution is presented in this Phase II TMDL with source information specified for Mill Creek and Rose Creek.

Land use and storm water runoff potential are given for each subbasin. This represents a more refined identification of basin sources than the Phase I Tuttle Creek Lake TMDL. It appears all sources have been considered.

**Allocation - Loading Capacity**

*Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a phase II TMDL the change in LC will be documented in this section.*

Allocations are divided by river basin which will result in the load to Tuttle Creek Lake. Loads are identified which will lead to compliance and are divided between Nebraska and Kansas portions of the combined watershed, the majority of which are from the Kansas portion of the watershed. This represents a more in depth allocation scheme than the Phase I Tuttle Creek Lake TMDL itself. Additionally, the LAs are defined for more subbasins than in the phase I TMDL.

**WLA Comment**

*Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.*

The WLA is 0 (zero).

**LA Comment**

*Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.*

May-June loads are separated by watershed and sampling station the daily loads are expressed in load duration curves. The examples here are calculated using average flows at each station. LAs for streams in Nebraska are calculated such that Kansas WQS will be met at the state boundary and identified as boundary conditions.

Site	daily maximum (pounds/day)
Big Blue River	
Barneston NE	27.8
Marysville KS	32.3
Little Blue River	
Hollen NE	14.0
Barnes KS	18.7
Black Vermillion River	
Frankfort KS	4.5
Mill Creek	
Washington KS	2.0
Rose Creek ,KS	0.06 pounds/day at median flow (3.4 cfs)

**Margin of Safety**

*Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.*

Only samples exceeding the criteria were used to calculate percent reductions to achieve an annual average concentration meeting WQS. This will result in an annual average that is lower than if all measurements were used to calculate reductions.

EPA recognizes this as an implicit MOS since it doesn't set aside an actual numeric load.

#### **Seasonal Variation and Critical Conditions**

*Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.*

The submittal demonstrates the seasonal component to atrazine loading based on the time of application and annual rainfall patterns. The MOS also addresses this by only using the season with most excursions in the WQS to calculate targeted reductions.

#### **Public Participation**

*Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].*

Public notice of this TMDL began January 5, 2006. An internet site was established to provide access for the public. Comments were received from the Kansas Corn Growers Association, Syngenta, Inc., EPA, and the Kansas City District of the U.S. Army Corps of Engineers. A public meeting was held January 19, 2007 in Olathe, KS and on January 30, 2006 in Topeka, KS. The Kansas-Lower Republican Basin Advisory Committee met on April 7, 2005 and October 20, 2005 in Lawrence, KS, July 26, 2005 in Concordia, KS, and January 24, 2006 in Topeka, KS. The water quality committee and the Compact Administration of the Blue River Compact met on May 3 and 12, 2005 to discuss the proposed TMDL. Copies of comments and KDHE's responses were submitted with the package.

#### **Monitoring Plan for TMDL(s) Under Phased Approach**

*The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].*

The watershed was sampled during the period between the first TMDL and this phase II TMDL. Continued monitoring for this Phase II TMDL will include collection of seasonal samples from Tuttle Creek Lake twice in the period 2006-2010. The Corps of Engineers will collect monthly samples April through September.

Routine bimonthly samples from permanent and rotational KDHE stream stations will be collected throughout the period 2006-2010.

#### **Reasonable assurance**

*Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.*

Reasonable assurances are not required as there are no point sources involved in the impairment targeted by this TMDL. The State of Kansas has authorities to direct activities in the watershed to reduce pollution. These include water and basin plans and the Federal Insecticide, Fungicide and Rodenticide Act.